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SPECIFICATION

1. Title of the Invention: IMAGE FORMING DEVICE

2. Claim

An image forming device including a light source for illuminating a source document, a photoreceptor, and a fan arranged to ventilate the device, comprising: an air inlet and an air outlet mounted on the outer covering of the device; and a partition arranged between the air inlet and the air outlet for preventing the exhausted air from being reintroduced.

3. Detailed Description of the Invention

Industrial Field of the Invention

The present invention relates to an image forming device having a light source for illuminating a source document, a photoreceptor, and a fan arranged to ventilate the device, more particularly to an arrangement of an air inlet and an air outlet of the image forming

device.

Related Art

Known image forming devices have a hole for air intake or air exhaust at the outer covering thereof in the vicinity of a fan which is provided to ventilate the device.

Problems to be Solved by the Invention

When a crossflow fan is used for ventilating air in the device or when an air inlet and an air outlet are arranged close to each other because of the space constraints of the device, the air once exhausted is reintroduced, resulting in a remarkably lowered ventilation efficiency.

Means for Solving the Problem

The arrangement of an air inlet and an air outlet of the image forming device according to the present invention is characterized in that a partition is provided between the air inlet and the air outlet in order to prevent the exhausted air from being reintroduced.

Operation

Because the arrangement according to the present invention has the partition between the air inlet and the air outlet, the air once exhausted is unlikely to be reintroduced via the air inlet blocked by the partition. This leads to always introducing fresh air from the air inlet, thereby ventilating air in the image forming device.

Embodiments

Fig. 1 is a side view illustrating an embodiment of the present invention. In Fig. 1, reference number 1 denotes a filamentous halogen

lamp. Light emitted from the lamp illuminates a source document 4 lying on a source document table 3 directly or after reflected at a lieberkuhn 2 and transmitting an infrared absorbing filter 8. The source document table 3 is composed of a transparent material such as blue flat glass. The source document 4 is scanned while the table 3 having the source document 4 thereon is moving in A or B direction.

A lens 5 and an exposure table 6 are disposed under a source-document illumination position C, and an unexposed photosensitive film 7 discharged from a cassette 20 moves on the exposure table 6 in the direction indicated by an arrow E at the same speed as the source document table 3. Microcapsules containing photocurable materials and color precursors are provided on the photosensitive film 7. Visible light reflected on the surface of the source document 4 is transmitted through the lens 5 and then is projected on the photosensitive film 7 moving on the exposure table 6 so as to cure microcapsules which are unnecessary for forming an image. The exposed photosensitive film 7 is forwarded to a pressure development mechanism 30 disposed under the exposure table 6. In the meantime, a sheet of transfer paper 41 is also discharged from a transfer paper cassette 40 and is forwarded to the pressure development mechanism 30. The exposed photosensitive film 7 and the sheet of transfer paper 41 are interposed and pressurized between pressure rollers 31 and 32 of the pressure development mechanism 30. This allows uncured microcapsules on the photosensitive film 7 to be crashed so as to form a colored image on the sheet of transfer paper 41. After pressure development, the photosensitive film 7 is returned

to the cassette 20 and is wound. At the same time, the sheet of transfer paper 41 is forwarded to heat treatment means 50 which accelerates the development and which also provides gloss on the surface of the sheet so as to form a complete image, and then is discharged from the device.

The large number of heat rays emitted from the halogen lamp 1 causes the lieberkuhn 2, the infrared absorbing filter 8, and so forth to reach such a high temperature that they break. To overcome this, an axial fan 9 cools down the halogen lamp 1, the lieberkuhn 2, the infrared absorbing filter 8, and so forth by blowing a partial amount of fresh air introduced from an air inlet 11. The hot air which had been used for cooling is fed through an exhaust duct 12, is mixed with a partial amount of air introduced from the air inlet 11 by a cross flow fan 10 so as to lower the temperature, and is discharged from an air outlet 13. Reference numeral 14 denotes a partition for preventing the hot air exhausted from the air outlet 13 from being reintroduced via the air inlet 11. Forming the bottom surface of the partition 14 to be concave allows the air exhausted from the air outlet 13 to flow downward along the concave surface, thereby preventing a larger amount of air from entering the air inlet 11. Further, when the image forming device has a clamshell structure in which the upper part thereof above the line D can be lifted around a rotation axis 60, the partition 14 may be used as a handle for lifting the upper part as well. Reference numeral 15 denotes an in-device partition for preventing fresh air from being mixed with exhausted air in the device.

Fig. 2 is a side view illustrating another embodiment of the present invention, characterized in that straightening vanes 16 are provided to the air inlet 11 and the air outlet 13 and are combined with the outer covering. The straightening vanes 16 of the air inlet 11 are arranged to introduce air above the image forming device and the straightening vanes 16 of the air outlet 13 are arranged to exhaust air below the image forming device so as to separate the intake air from the exhaust air. The straightening vanes 16 provided to either one of the air inlet 11 and the air outlet 13 offer a similar effect.

Fig. 3 is a side view of yet another embodiment of the present invention, which is similar to the embodiment shown in Fig. 1 with the exception that the air inlet 11 and the air outlet 13 exchange their positions and the axial fan 9 alone is provided. According to the embodiment shown in Fig. 3, the exhausted hot air is discharged from the air outlet 13 disposed over the air inlet 11 and is dispersed upward, thereby allowing intake air to be separated from exhaust air more effectively.

Although the description of embodiments of the present invention refers to cooling the light source by way of example, the present invention is also applicable to cooling the other components and cooling the entire image forming device. Also, the present invention is not limited to cooling, but is effective to any structures requiring fresh air to be introduced all the time. Further, it will be appreciated that the present invention is applicable to image forming devices such as the one having a stationary source document table, and the one having a

photosensitive drum.

Advantages

According to the present invention as described above, a partition is provided between an air inlet and an air outlet. This partition makes it unlikely that exhausted air be reintroduced via the air inlet. As a result, fresh air can always be introduced via the air inlet, thereby preventing a reduction in ventilation efficiency even though the air inlet lies close to the air outlet.

Further, the partition serves as a handle for lifting the upper part of the clamshell-structured image forming device around the rotating axis thereof.

4. Brief Description of the Drawings

Fig. 1 is a side view of an image forming device according to the present invention; and

Figs. 2 and 3 are side views of other embodiments of the image forming device according to the present invention.

3 source document table

5 lens

6 exposure table

7 photosensitive film

8 infrared absorbing filter

9 axial fan

10 crossflow fan

11 air inlet

12 exhaust duct

13 air outlet

14 partition

15 in-device partition

16 straightening vane

30 pressure development mechanism

41 transfer paper

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Fig. 1

1 halogen lamp

3 source document table

6 exposure table

7 photosensitive film

8 infrared absorbing filter

9 axial fan

10 crossflow fan

11 air inlet

12 exhaust duct

13 air outlet

14 partition

15 in-device partition

30 pressure development mechanism

31 pressure roller

32 pressure roller

41 transfer paper

FIG. 2

9 axial fan

10 crossflow fan

11 air inlet

12 exhaust duct

13 air outlet

15 in-device partition

16 straightening vane

Fig. 3

8 infrared absorbing filter

9 axial fan

11 air inlet

12 exhaust duct

13 air outlet

14 partition